PATENT SPECIFICATION
NO DRAWINGS

985,613

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Date of Application and filing Complete Specification May 30, 1963.
No. 21576/63.
Application made in United States of America (No. 199648) on June 4, 1962.
Complete Specification Published March 10, 1965.

Index at acceptance: —A2 B(1B, 1R, 1S, J3F1, J3F2)
Int. Cl.:—A 23 b, k, l

COMPLETE SPECIFICATION

Enrichment of Foods and Feeds

ERRATA

SPECIFICATION No. 985,613

Page 1, line 3, *for* "Balse" *read* "Basle"
Page 1, line 47, *after* "are" *insert* "conventionally enriched with such products"
Page 1, *delete* line 49
Page 1, line 83, *for* "and" *read* "or"
Page 2, line 111, *for* "hydrogularetic" *read* "hydroguiaretic"
Page 3, line 2, *for* "antioxidants" *read* "antioxidant"
Page 4, line 27, *insert* "the" *after* "in"
Page 4, line 126, *for* "504,0" *read* "230.0"

THE PATENT OFFICE
9th April 1965

the development of products in dry or beadlet form. By and large, the vitamin and/or carotenoid components of these beadlet-type products have been found to be both stable and biologically available. These beadlet-type products have been proven to be completely satisfactory for many uses, but there remain certain applications for which beadlet-type products are not well suited. As an example there can be mentioned the vitamin and/or carotenoid enrichment of those animal and poultry feeds which are to be pelleted, steamed and pelleted, or cooked and extruded. In the enrichment of such feeds, the vitamins or carotenoids are usually added to the mash feed prior to the processing operation. During processing, the mash feed is subjected to conditions of high temperatures and high moisture. Such conditions, when prolonged, can and often do result in the destruction of the vitamins and/or the carotenoids.

There are other applications where the use of [illegible] enriched products, vitamins and carotenoids have been applied to food and feed particles in the form of oil solutions and emulsions. Such techniques have, however, proven to be most unsatisfactory since up to now no provision has been made for the protection of the vitamins and carotenoids thus applied against oxidation. Past experience has shown that destruction of the vitamins and carotenoids in such products is quite rapid.

It has now been discovered that uniform enrichment of variegated food and feed particles can be accomplished by applying thereto, in the manner to be described hereinafter, certain vitamin-containing and/or carotenoid-containing compositions which have high molecular weight protein and carbohydrate emulsifying agents as a component thereof and that the vitamins and/or carotenoids in such products are stable and from the biological standpoint, completely available.

[*Price* 4*s*. 6*d*.]

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COMPLETE SPECIFICATION

Enrichment of Foods and Feeds

We, F. HOFFMANN-LA ROCHE & Co., AKTIENGESELLSCHAFT, a Swiss Company of 124—184 Grenzacherstrasse, Balse, Switzerland, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The present invention is concerned with the enrichment of foods and feeds and with novel compositions useful for this purpose.

The use of vitamin-containing and/or carotenoid-containing products to supplement or enrich the natural nutritional values of many foods and feeds is well known. Further, the use of carotenoid compounds (for example, *beta*carotene) to improve the colour of foods and feeds is also known. In recent years, a considerable amount of time and effort has been expended in an attempt to develop stable vitamin of carotenoid supplements. Particular emphasis has been placed on the development of products in dry or beadlet form. By and large, the vitamin and/or carotenoid components of these beadlet-type products have been found to be both stable and biologically available. These beadlet-type products have been proven to be completely satisfactory for many uses, but there remain certain applications for which beadlet-type products are not well suited. As an example there can be mentioned the vitamin and/or carotenoid enrichment of those animal and poultry feeds which are to be pelleted, steamed and pelleted, or cooked and extruded. In the enrichment of such feeds, the vitamins or carotenoids are usually added to the mash feed prior to the processing operation. During processing, the mash feed is subjected to conditions of high temperatures and high moisture. Such conditions, when prolonged, can and often do result in the destruction of the vitamins and/or the carotenoids.

There are other applications where the use of dry vitamin and/or carotenoid enrichment products leaves much to be desired. For example, many of the foods and feeds which are are manufactured in the form of flakes or are manufactured in the for mof flakes or pellets or other large aggregates. In dry form, stabilized vitamin and/or carotenoid products are powders, beadlets or comparatively small aggregates. Because of the large difference between the particle size of the food or feed and that of the enriching substance, it is virtually impossible to produce a uniformly enriched food or feed using dry supplements. The smaller particles tend to filter through the larger aggregates. Desired uniform enrichment can be achieved only when the vitamin or carotenoid product is provided in a form which will allow it to adhere to, or at least remain in close contact with, each particle of food and feed to which it is applied.

In an attempt to provide uniformly enriched products, vitamins and carotenoids have been applied to food and feed particles in the form of oil solutions and emulsions. Such techniques have, however, proven to be most unsatisfactory since up to now no provision has been made for the protection of the vitamins and carotenoids thus applied against oxidation. Past experience has shown that destruction of the vitamins and carotenoids in such products is quite rapid.

It has now been discovered that uniform enrichment of variegated food and feed particles can be accomplished by applying thereto, in the manner to be described hereinafter, certain vitamin-containing and/or carotenoid-containing compositions which have high molecular weight protein and carbohydrate emulsifying agents as a component thereof and that the vitamins and/or carotenoids in such products are stable and from the biological standpoint, completely available.

[Price 4s. 6d.]

The food and feed enrichment composition provided by the invention comprises an aqueous emulsion containing a fat-soluble vitamin or carotenoid or a mixture thereof, an edible emulsifier, an edible antioxidant and an edible preservative and, in admixture therewith, a predominant amount of dextrins, sugars or cellulose derivatives or mixtures thereof in the form of an aqueous solution.

The enrichment process provided by the invention comprises applying to said food and feed a composition which consists of an aqueous emulsion or dispersion of fat-soluble vitamins or of carotenoids or mixtures thereof in admixture with a predominant amount of dextrins, sugars or cellulose derivatives or mixtures thereof in the form of an aqueous solution; said emulsion consisting of said vitamins and/or carotenoids, an edible emulsifier, an edible antioxidant, an edible preservative and water.

The aqueous emulsion or colloidal dispersion of the fat-soluble vitamin or the carotenoid or mixture thereof is first prepared. For simplicity these emulsions or dispersions will be referred to hereinafter in this description and in the claims appendant hereto simply as emulsions. In preparing these emulsions, edible emulsifying agents, antioxidants and preservatives which are known in the art are employed. The characterizing feature of the present invention is the fact that, prior to their use, the emulsions are mixed with an edible diluent or extender to be described hereinafter to provide free-flowing liquid compositions, These liquid compositions can then be applied, directly and by conventional means, to the food or feed. When applied to a food or feed the compositions dry to a hard oxygen-impermeable film layer on the surface of the food or feed particle or in its pores if it is a porous product. The vitamin or carotenoid component is distributed throughout the film in a substantially uniform fashion.

The fat-soluble vitamin used in carrying out the invention may be a single fat-soluble vitamin or a mixture of fat-soluble vitamins. Thus, for example, it can be vitamin-A, vitamin-D, vitamin-E, vitamin-K or a mixture thereof. Precursors of vitamin-A such as the carotenes can also be used, as well as related carotenoids such as β-apo-8^1-carotenal, esters of β-apo-8^1 carotenoic acid, canthaxanthin, zeaxanthin and other polyoxy carotenoids. In the preferred embodiment vitamin-A, vitamin-D, a carotenoid or a mixture thereof is employed. If desired, water-soluble vitamins, particularly those such as ascorbic acid which are susceptible to destruction by oxidation, can be incorporated into the product.

As the source of vitamin-A, one can use vitamin-A in alcohol or in ester form. Further, vitamin-A containing fish oils and fish liver oils as well as concentrates obtained therefrom can be used. The quantity of vitamin-A which may be used in producing the preferred products of this invention can be varied over a rather wide range. In general, however, the emulsions will contain from 10,000 IU to 1,000,000 IU of vitamin-A per gram. Where vitamin-D is employed, the emulsion will preferably contain from 1,000 IU to 100,000 IU of vitamin-D per gram. In the case of a carotenoid emulsion, such emulsion will contain from 10 mg to 250 mg of the carotenoid per gram.

Any edible matrix emulsifier can be used in producing the novel compositions. The expression "matrix emulsifier" is used herein to denote those high molecular weight protein or carbohydrate emulsifying agents which tend to form a film which encases the oil phase when the emulsion containing such an emulsifier is dried. Such emulsifiers are well known in the art. Matrix emulsifiers which have been found to be particularly well suited for use in the practice of the present invention include, for example, gum acacia, gum ghatti, algin derivatives, gelatine, hydrolysed collagens, starch, dextrin and soya protein. Gum acacia is, however, used in producing the preferred products. The term 'hydrolysed collagens' is used to denote a material obtained by hydrolysing collagen (the raw material used in the manufacture of gelatin) until it has almost lost its gel strength.

The quantity of emulsifying agent which is used in preparing the present products may vary considerably. Broadly, the emulsions will contain from 20% by weight to 50% by weight of emulsifying agent. The emulsions which are used in producing the preferred products will, however, contain from 30% to 40% by weight of emulsifying agent.

Edible antioxidants, such as propyl gallate, butylated hydroxy-anisole, butylated hydroxy - toluene, 6 - ethoxy - 2,2,4 - trimethyl - 1,2 - dihydro - quinoline, nordihydrogularetic acid, or mixtures thereof, can be employed in the practice of this invention. Butylated hydroxy-toluene is used in producing the preferred products. It should be understood, however, that the invention is not restricted to the use of the antioxidants heretofore specifically named. In general, any of the well-known edible antioxidants can be used in producing the emulsions of this invention.

The quantity of antioxidant employed is not particularly critical. A sufficient quantity of antioxidant should be incorporated in the emulsion to obviate, or at least minimize, destruction of the vitamin component thereof. In general, this will be accomplished when there is incorporated in the emulsion from 0.2% to 15% by weight of antioxidant. The emulsions which are used in producing the preferred products of the invention con-

tain from 2.0% to 3.0% by weight of edible antioxidants.

As mentioned earlier, the emulsions contain edible preservatives in addition to the antioxidants. The edible preservatives serve to prevent mould formation on or bacterial decomposition of the compositions which are to be applied to the basic food or feed. In general any of the known edible preservatives can be employed. However, compounds, such as sodium benzoate and sorbic acid have been found to be particularly well suited. The amount of preservative which is used is not especially critical. For example, the preservative may comprise up to 0.5% of the total weight of the emulsion. However, it is preferred that this component comprises from 0.1% to 0.25% of the total weight of the emulsion.

Various procedures are available by which the emulsions can be prepared. These procedures will be immediately apparent to those skilled in the art. The following, however, is the method preferably used in producing the emulsions. In the preferred procedure, the emulsifying agent is first dissolved in water. The preservative is then added to this solution. In a separate vessel, a solution containing the enrichment substance (i.e. the vitamin or carotenoid or mixture thereof) and the edible antioxidant is prepared. In the case of a vitamin, the desired solution is obtained by dissolving the antioxidant in the vitamin. In the case of a carotenoid, the solution is obtained by dissolving the carotenoid and the antioxidant in an edible glyceride oil such as, for example, coconut oil. Formation of the solution is carried out, preferably, at a temperature around room temperature. However, if necessary, the mixture can be heated to above room temperature. The mixture is then added to and mixed with the aqueous solution containing the emulsifying agent. The desired emulsion is thereupon produced by conventional techniques.

Prior to their use in the enrichment of foods and feeds, the emulsions are mixed with suitable water-soluble extenders or diluents. As extender or diluent, there may be used an aqueous sugar solution, an aqueous dextrin solution or an aqueous solution of a cellulose derivative. For example, aqueous solutions of sucrose, dextrose, invert sugar, methyl cellulose or carboxymethyl cellulose can be employed. Additionally, the emulsions can be diluted or extended, if desired, using additional quantities of any of the matrix emulsifiers mentioned heretofore in the form of aqueous solutions. Aqueous solutions of vegetable gums (such as gum ghatti and gum acacia) are particularly well suited for use. The desired products are obtained merely by mixing the emulsion with the solution of the sugar, dextrin or cellulose derivative at normal room temperatures. If desired, however, the step of mixing the emulsion with the diluent can be carried out at temperatures which are elevated somewhat above room temperature. In the preferred practice of this invention, this mixing operation is carried out at room temperature.

Aqueous sugar solutions or aqueous dextrin solutions of varying concentrations can be used. It has been found in general that the best results are obtained when the emulsion is mixed with an aqueous solution containing from 40% to 60% of sugar or dextrin.

The quantity of the aqueous diluent solution used depends upon the vitamin or carotenoid potency desired in the final food or feed. However, it is necessary that the amount of diluent, that is, the aqueous solutions of the sugars, dextrins or cellulose derivatives or mixtures thereof, is predominant compared with the amount of the emulsion with which it is to be mixed. In relation to the food and feed the diluent preferably comprises from 0.5% to about 10%, most frequently between 0.5% to 4% of said food and feeds.

As indicated earlier the compositions of the present invention are readily produced. When applied to a food or fee they will either form a hard, oxygen-impermeable film on the surface or, in the case of a porous food or feed they will soak into the pores and harden and lock in the vitamin or carotenoid ingredient so that it is protected against the oxidative influences of the atmosphere. From this it will be readily appreciated that the compositions are well suited for use in the enrichment of most foods and feeds. Since the compositions are liquid in nature, they are especially well suited for enriching flaked or irregularly shaped food products such as breakfast cereals, potato flakes, popcorn and cookies, as well as dog biscuits and the previously mentioned pelleted animal and poultry feeds. Further, the compositions can be used in the enrichment of non-fat milk solids. Furthermore, in the case of compositions containing carotenoids, they can be used to impart uniform colouration to various foods and feeds. As a general rule the compositions of this invention will be added by the food or feed manufacturer at a late stage in the processing of the food or feed. Thus, in the case of baked foods such as cereals and pelleted feeds such as dog foods, the compositions will be added thereto after the baking and pelleting has been completed. In this latter respect, the present products are unlike the conventional dry stabilized products which are, or would have to be, added prior to the baking and pelleting operation.

The compositions can be applied by any convenient or appropriate means to the materials to be enriched. A preferred method for enriching the food and feed particles is by spraying same with the compositions. However, these compositions can be applied

to the food or feed merely by intimately mixing the liquid with the food or feed particles, or by other suitable methods.

The vitamin or carotenoid components of the compositions of the invention are extremely stable for long periods of time, even when exposed to conditions of relatively high temperature and high humidity. Further, the vitamin and carotenoid components of the compositions are completely available biologically.

The following examples are given by way of illustration of the invention:

EXAMPLE 1

A vitamin-A emulsion with a potency of 500,000 IU per gram was prepared using the following ingredients in the quantities indicated:

	grams
Vitamin-A palmitate	314.0
Butylated hydroxy-toluene	50.0
Gum acacia	286.0
Sodium benzoate	2.4
Water	348.0

The emulsion was prepared as follows: The gum acacia and sodium benzoate were dissolved in water by warming to 60°C. The butylated hydroxy-toluene was dissolved in the vitamin-A palmitate by warming to 60°C. The latter solution was then emulsified in the gum acacia solution.

A. 0.5 gram of the emulsion produced as described in the preceding paragraph was diluted with 400 grams of a 50% sucrose solution in water. Thereafter, 40 grams of this diluted emulsion were sprayed on to 908 grams of pelleted broiler mash in a rotating pan. The pellets were then dried at 45°C in an oven. The vitamin-A showed excellent stability after storage tests.

B. 0.5 gram of the emulsion produced as described in the first paragraph of this example was diluted with 200 grams of starch syrup. Thereafter, 20 grams of this dilution were sprayed on to one pound of a wheat flakes breakfast cereal in a rotating pan, followed by drying the flakes at 45°C in an oven. The vitamin-A stability was excellent for the full shelf life of the cereal.

EXAMPLE 2

A vitamin-A vitamin-D_2 emulsion with a potency of 500,000 IU of vitamin-A and 50,000 IU of vitamin-D_2 per gram was prepared using the following ingredients in the quantities indicated:

	grams
Vitamin-A palmitate	314.0
Vitamin-D_2 (calciferol)	1.4
Butylated hydroxy-toluene	27.5
*Alpha*tocopherol	6.9
Hydrolyzed collagen	260.0
Sodium benzoate	2.4
Water	388.0

The emulsion was prepared in the following manner: The butylated hydroxy-toluene, vitamin-D_2 and *alpha*tocopherol were dissolved in the vitamin-A palmitate by warming to 60°C. The hydrolyzed collagen and sodium benzoate were dissolved in the water. Thereafter, the vitamin-A palmitate solution was emulsified in the latter aqueous solution.

0.5 gram of the emulsion produced as described in the preceding paragraph was diluted with 200 grams of a 50% invert sugar syrup. Then, 20 grams of this dilution was sprayed on to one pound of a flaked corn cereal in a rotating pan, followed by drying the cereal in an oven at 45°C. The retention of the vitamin-A and vitamin-D on storage of the dry cereal was very good.

EXAMPLE 3

A vitamin-A emulsion with a potency of 500,000 IU per gram was prepared using the following ingredients in the quantities indicated:

	grams
Vitamin-A palmitate	314.0
Butylated hydroxy-toluene	50.0
Gum acacia	200.0
Amioca 85	100.0
Sodium benzoate	2.4
Water	334.0

The emulsion was prepared as follows: The gum acacia and sodium benzoate were dissolved in 200 ml of water by heating to 60° C. Amylopectin starch was mixed with 30 ml of ethyl alcohol and then with 134 ml of water and heated to boiling for five minutes until solution was complete. The starch solution was then added to the gum acacia solution and the mixture cooled to 60°C. Butylated hydroxy-toluene was dissolved in the vitamin-A palmitate at 60°C and the solution, thus obtained, was emulsified into the gum acacia-starch solution.

0.5 gram of the emulsion, produced as described in the preceding paragraph, was diluted with 200 grams of a 50% aqueous gum acacia solution. Thereafter, 20 grams of this dilution were sprayed on about one pound of baked dog biscuits, followed by drying the biscuits at 45°C in an oven. Vitamin-A retention on storage of the dog biscuits was very good.

EXAMPLE 4

A vitamin-A emulsion with a potency of 1,000,000 IU per gram was prepared using the following ingredients in the quantities indicated:

	grams
Vitamin-A acetate	393.0
Butylated hydroxy-toluene	61.0
*Alpha*tocopherol	14.0
Gum acacia	300.0
Sodium benzoate	2.4
Water	504,0

The emulsion was prepared as follows. The butylated hydroxytoluene and *alpha*tocopherol were dissolved in the vitamin-A acetate by heating to 60°C. This solution was then emulsified in the (gum acacia)/sodium banzoate/water solution.

0.5 gram of the emulsion produced as described in the preceding paragraph was diluted with 400 grams of a starch syrup. Thereafter, 20 grams of the diluted emulsion were sprayed onto an exploded rice breakfast cereal in a rotating pan. The cereal was then dried in an oven at 45°C. The retention of vitamin-A for the shelf life of the cereal was very good.

EXAMPLE 5

An emulsion of vitamin-A, vitamin-D_3 and vitamin-E with a potency of 250,000 IU of vitamin-A, 25,000 IU of vitamin-D_3 and 25 IU of vitamin-E per gram was prepared using the following ingredients in the quantities indicated:

	grams
Vitamin-A palmitate	157.0
Vitamin-D_3 resin	1.1
*dl alpha*tocopheryl acetate	25.0
Butylated hydroxy-toluene	25.0
Dextrin	286.0
Sodium benzoate	2.4
Water	504.0

[The vitamin-D_3 resin is a commercially available vitamin-D_3 product obtained by the irradiation of sterins and having a content of ca 20 million I.U. of vitamin-D_3 per gram]

The emulsion was prepared as follows: The vitamin-D_3, *dl alpha*tocopheryl acetate and butylated hydroxy-toluene were dissolved in the vitamin-A palmitate by warming to 90° C. The solution obtained was emulsified in the dextrin/(sodium benzoate)/water solution.

1.0 gram of the emulsion produced as described in the preceding paragraph was diluted with 400 grams of 50% aqueous sucrose solution. Thereafter, 40 grams of this diluted emulsion were sprayed on to about 2 pounds of pelleted broiler mash in a rotating pan. The pellets were subsequently dried at 45° C in an oven. Upon storage of the pelleted feed at room temperature and elevated temperatures, the retention of vitamin-A, Vitamin-D_3 and vitamin-E was found to be very good.

EXAMPLE 6

A *beta*carotene emulsion containing 3.6% *beta*carotene was prepared using the following-named ingredients in the quantities indicated:

	grams
*Beta*carotene	38.0
Coconut oil	210.0
Butylated hydroxytoluene	6.4
Butylated hydroxy-anisole	0.64
Hydrolyzed collagen	300.0
Sodium benzoate	2.4
Citric acid	6.0
Water	408.0

The emulsion was prepared as follows: The butylated hydroxy-toluene and butylated hydroxy-anisole were dissolved in the coconut oil and the solution heated to 150°C and the *beta*carotene added thereto. The oil was maintained at 150°C until all of the *beta*carotene had dissolved. Thereafter, the hot oil solution emulsified into the aqueous solution of the (hydrolyzed collagen)/(sodium benzoate)/citric acid.

1.0 gram of the emulsion produced as described in the preceding paragraph was diluted with 29 grams of 50% aqueous dextrin solution. Thereafter, 20 grams of the diluted emulsion were sprayed on to one pound of an exploded oat cereal in a rotating pan. The cereal was subsequently dried in an oven at 45°C. The oat cereal, originally white in colour, assumed a pleasing yellow-orange colour. Upon storage, the *beta*carotene retention was very good for the shelf life of the cereal.

EXAMPLE 7

A β-apo-8^1-carotenal emulsion with a concentration of 5% β-apo-8^1-carotenal was prepared using the following ingredients in the quantities indicated:

	grams
β-Apo-8^1-carotenal	55.0
Coconut oil	150.0
Butylated hydroxytoluene	10.0
Butylated hydroxy-anisole	1.0
Hydrolyzed collagen (50% aqueous solution)	620.0
Sodium benzoate	2.4
Water	162.0

The emulsion was prepared by the same procedure as was used in producing the emulsion of Example 6.

0.4 gram of the emulsion was diluted with 200 grams of starch syrup. Thereafter, this diluted emulsion was sprayed on to a pelleted laying hen mash as the hot pellets came out of the pelleting machine. The pellets were cooled and packaged by conventional techniques. The stability of the β-apo-8^1-carotenal on the stored feed was very good.

EXAMPLE 8

A canthaxanthin emulsion with a concentration of 1% canthaxanthin was prepared using the following-named ingredients in the quantities indicated:

	grams
Canthaxanthin	11.0
Coconut oil	150.0
Butylated hydroxy-toluene	2.0
Butylated hydroxy-anisole	0.2
Hydrolyzed collagen (50% aqueous solution)	620.0

Sodium benzoate	2.4
Water	170.0

The emulsion was produced by the same procedure as was used in producing the emulsion of Example 6.

2.0 grams of the emulsion was diluted with 200 grams of a 50% aqueous dextrose syrup and the diluted emulsion was subsequently sprayed on to a pelleted high energy broiler mash as the hot pellets came out of the machine. The pellets were cooled and packaged by conventional techniques. The stability of the canthaxanthin on the stored feed was very good.

EXAMPLE 9

A product was prepared using similar ingredients to those used in Example 8 and in similar quantities, except that 2.2 grams of 6 - ethoxy - 2,2,4 - trimethyl - 1,2 - dihydro-quinoline were used in place of the butylated hydroxy-toluene and butylated hydroxy-anisole.

After dilution with 50% aqueous dextrose syrup, the product was sprayed on to a pelleted high energy broiler mash. The stability of the canthaxanthin on the stored feed proved to be very good.

WHAT WE CLAIM IS:—

1) A process for the enrichment of food or feeds which comprises applying to the basic food or feed a composition which consists of an aqueous emulsion or dispersion of fat-soluble vitamins or of caroteneoids or mixtures thereof in admixture with a predominant amonut of dextrins, sugars or cellulose derivatives or mixtures thereof in the form of an aqueous solution, said emulsion consisting of said vitamins and/or carotenoids, an edible emulsifier, an edible antioxidant, an edible preservative and water.

2) A process in accordance with claim 1, wherein said composition is formed prior to application by making a solution of the edible antioxidant in the fat-soluble vitamin and/or the carotenoid (with the addition of an edible glyceride oil if necessary), emulsifying the solution thus obtained in an aqueous solution containing an edible matrix emulsifier and mixing the so-formed emulsion with the dextrins, sugars or cellulose derivatives or mixtures thereof contained in aqueous solution.

3) A process as claimed in claim 1 or claim 2, wherein the composition is applied to said food or feed by spraying.

4) A process as claimed in any one of the preceding claims, wherein the emulsifier is gum acacia, hydrolysed collagen or dextrin.

5) A composition for the enrichment of foods or feeds, which composition comprises an aqueous emulsion containing a fat-soluble vitamin or carotenoid or a mixture thereof, an edible emulsifier, an edible antioxidant and an edible preservative and, in admixture therewith, a predominant amount of dextrins, sugars or cellulose derivatives or mixtures thereof in the form of an aqueous solution.

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Leamington Spa: Printed for Her Majesty's Stationery Office by the Courier Press.—1965.
Published at The Patent Office, 25, Southampton Buildings, London, W.C.2, from which copies may be obtained